

CO IR Status

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FNAL

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- Convert Tevatron CO to a "normal straight" section
 - Enables staged installation of BTeV detector components
- Install a new low- β Interaction Region at CO in the Tevatron for the BTeV experiment
 - $\beta^* = 35\text{cm}$
 - Consistent with continuing operation of CDF and D0
 - For example, alternating CDF/D0 stores and BTeV stores
 - Makes use of full luminosity available from the Tevatron at the time of installation
 - All devices "keep clear" of the CO Collision Hall
 - Tevatron beamline will be completely changed between B43 and C17 (~445m); minor changes elsewhere in the Tevatron
 - Installation in the B4, C1, and CO service buildings
 - Major new components are spools (correction magnets) and low beta quads
 - Also includes new PSs, ES separators, cryogenic devices, instrumentation and controls mods, software mods

WBS Structure

- 2.1 New Magnets
- 2.2 2005 Shutdown (convert CO to "normal" straight section)
- 2.3 New Power Supplies
- 2.4 Cryogenic Systems
- 2.5 Controls
- 2.6 Instrumentation
- 2.7 Electrostatic Separators
- 2.8 2008 Shutdown
- 2.9 2006 Shutdown (currently no work planned)
- 2.10 2007 Shutdown
- 2.11 2009 Shutdown (install CO IR)
- 2.12 Hardware commissioning
- 2.13 Overall project management (includes accelerator physics calculations)

- "Advanced" Conceptual Design Report
- Open Plan WBS
- Chapter in BTeV CDR
- Project Management Plan
- Personnel Expertise document
- Hazard Analysis
- Risk Assessment
- Requirements document
- Response to February CO IR Temple Review
- 2 Plenary talks (Church, Kerby)
- 7 breakout talks (accelerator physics, corrector magnets, spool design, quad design, HTS leads, overall cost/schedule, magnet cost/schedule)

- Lattice design has been stable since 2/01
- Initial tracking and dynamic aperture calculations have been done
 - Dynamic aperture is good; beam-beam tune spread is small
 - These calculations will continue
- Beam halo calculations have been completed
 - Halo mitigation with present Tevatron collimator system, B48 collimator, and shield wall appears to be adequate
- Investigation of other helix solutions
 - May depend on what is learned in Run II
- See **J Johnstone** breakout talk for more details

- Power Supplies

- 3 10 kA supplies for LHC-style low beta quads
 - Based on recent MI design
- 4 5kA supplies for reused Tevatron low beta quads
 - Based on recent MI design
- Electrostatic separator power supplies (3 new, 1 reused)
 - Original Tevatron design
- 50 A supplies for corrector magnets
 - Based on recent MI design

- Cryogenic devices

- 10 new cryogenic spools (warm bypasses, spacers, feedcans)
 - Lengths vary from .15m to 9m
- Modification to He and N₂ headers in tunnel

- 6 Electrostatic separators (4 new, 2 reused)
 - Standard Tevatron design, but may make use of any upgrades developed for Run II
- Controls and Instrumentation
 - QPM system for new low beta quads
 - BPMs
 - New synchrotron light monitor
 - Minor changes to large suite of operational, control, and instrumentation software
- Infrastructure
 - LCW (Low Conductivity Water) for Collision and Assembly Halls
 - Extensive new buswork for low beta quads

- Project team in place and functional
- Lattice design stable
- Additional calculations in progress
- “Advanced” Conceptual Design Report to evolve into Technical Design Report
- Cost and schedule estimates being refined (see Church and Chichili breakout talks)
- Design work on spools and low beta quads (see J Kerby talk)
- Contacting vendors for corrector magnet fabrication (see J Kerby talk)